

## MINUTES OF LATEST TRUSTEE'S MEETING

MEETING OF THE BOARD OF TRUSTEES  
American Society for Metals  
Cleveland  
Jan. 18, 1934  
Present: W. H. Phillips  
B. F. Shepherd  
W. H. Eisenman  
Emil Gathmann  
W. B. Coleman  
R. S. Archer  
H. G. Keshian  
W. P. Woodside  
E. C. Bain

The first order of business was the consideration of a set of by-laws, as follows:

**ARTICLE I  
AIMS AND PURPOSES**  
The object of the Society shall be to promote the arts and sciences connected with either the manufacture or the treatment of metals, or both.

**ARTICLE II  
MEETING OF BOARD OF TRUSTEES**  
Section 1. There shall be at least three meetings of the Board of Trustees in each fiscal year. Meetings shall be held at such times and places as may be fixed by the Board or designated by the President.

**NOTICE OF MEETINGS OF TRUSTEES**  
Section 2. There shall be at least ten days' notice by mail to each Trustee of each meeting of the Board.

**PROGRAM OF MEETING OF TRUSTEES**  
Section 3. A tentative program of each meeting of the Board shall be made by the National Secretary with the advice of the President and mailed to each Trustee at least three days before the meeting.

**STANDING COMMITTEES**  
The Recommended Practices Committee shall consist of at least six members, in addition to the ex-officio members thereof, who shall be members of the Society and/or individual representatives of a member firm or corporation.

**REPORTS TO BOARD OF TRUSTEES**  
All reports made to the Board shall be in writing except where written submission shall be expressly waived by the Board.

**AMENDMENTS TO BY-LAWS**  
These By-Laws may be amended from time to time upon the affirmative vote of at least six members of the Board of Trustees.

Upon motion by Mr. Coleman, seconded by Mr. Keshian and unanimously carried, the by-laws of the American Society for Metals were adopted.

Upon motion properly made, seconded and unanimously carried, the minutes of the meeting of the board of trustees held in Detroit on Oct. 1, and also the meeting held in Detroit on Oct. 3, together with the minutes of the annual meeting of the Society held in Detroit on Oct. 4 and the special meeting of the Society held in Cleveland on Dec. 20 were approved.

The following committee appointments were presented to the board of directors and confirmed:

President Phillips presented the names of the following men for membership on the Publication Committee for a period of three years: Claude Clark, Detroit chapter; R. F. Mehl, Pittsburgh chapter; Wayne Cockrell,

Continued on Page Two

## BAIN EXPLAINS HOW ALLOYS AFFECT STEEL PROPERTIES

Detroit's Meeting Interesting

By Scott C. Taylor

At Detroit chapter's November meeting a very interesting talk was given by Dr. E. C. Bain, of the Research Laboratory of the U. S. Steel Corp. on the subject, "The Role of the Common Elements in Alloy Steel."

His method of approach was to consider the limitations of plain carbon steel and set forth the manner in which alloying elements extend these limits. The alloying elements act chiefly to permit the development of a desirable structure throughout the cross-section of shapes in which only a pearlitic structure can be induced in carbon steel. For small sections of carbon steel Mr. Bain gave data which illustrated that alloy steel properties were obtainable when the heat treatment developed a structure comparable with that of alloy steel.

All elements, when actually in homogeneous solid solution in the austenite, contribute toward deep hardening, but with some elements the carbide dissolves reluctantly and little of the element is effective. Carbide or non-metallic particles restrict grain growth in austenite, thereby limiting hardenability. Thus molybdenum, as carbide, may maintain a fine grain or aluminum, as alumina, may even more effectively retain a fine grain and a lower hardenability.

## PITTSBURGH STUDIES THEORY AND PRACTICE OF WELDING

Dr. G. E. Doan is Speaker

By George P. Halliwell

At the third meeting of the Pittsburgh chapter Dr. Gilbert E. Doan, associate professor of metallurgy at Lehigh University, was the speaker. His subject was "Theory and Practice of the New Welding Processes."

Dr. Doan stressed the improvement in mechanical properties of the weld by the use of the shielded arc and alloy steel rods. He pointed out also that stress relief by annealing was practiced wherever feasible.

One of the more recent developments of the oxyacetylene torch was for removing surface ingot defects, descaling, initiating holes in billets for piercing and for the removal of large masses of metal before final machining. The processes for welding by means of copper in a hydrogen atmosphere was very clearly described. By capillary attraction molten copper fills up the most minute cracks, provided they are oxide free. Dr. Doan also described the new processes of shot welding 18-8, whereby the problem of corrosion around the weld was eliminated or reduced to a minimum.

## BRIGGS TELLS OF NEW CASTING FACTS

Gives Baltimore Results of Study of Steel Castings

By Stanley P. Watkins

The regular monthly meeting of Baltimore chapter was held Nov. 18. Our chairman, H. C. Ballard, introduced the speaker for the evening, C. W. Briggs, physical metallurgist, U. S. Naval Research Laboratories, who spoke on the "Developments in Steel Castings."

Mr. Briggs stated that due to the restriction of armaments, our Navy Department was vitally interested in reducing the dead weight of naval vessels. This prompted a research program by the Naval Research Laboratories to reduce the weight of steel castings, and yet make sound castings.

The investigational work, Mr. Briggs stated, was concerned largely with controlled directional solidification, as they believed that this was the logical means to produce sound castings without internal strains.

The investigation brought out that crust formation does not proceed uniformly, and that the liquid contraction was about two to four times greater per degree than solid contraction. It was further noted that the freezing contraction was about 5.5% greater than the liquid contraction.

The principal defects encountered in steel castings are "hot tears," a term applied to internal cracks, which occur during solidification. Mr. Briggs stated that external cracks occur after solidification.

## A. M. STEEVER TALKS ON DROP FORGINGS TO WASHINGTON MEN

Meeting on Nov. 17 Pleases

By William H. Swanger

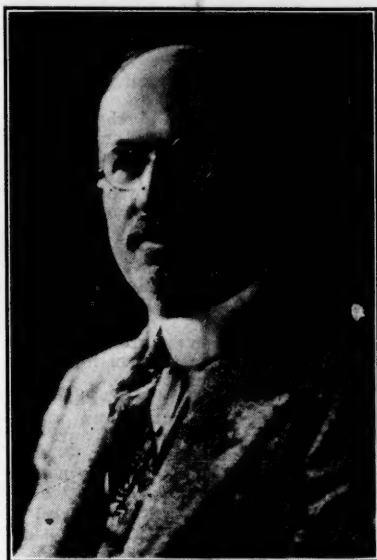
The second meeting of the Washington chapter, on Nov. 17, was addressed by Adam M. Steever, vice president and technical director, Lindberg Steel Treating Co., Chicago, Illinois, on the subject of "Drop Forging."

Mr. Steever, a recognized authority on the subject, discussed the various factors involved in the successful production of drop forgings. His talk and replies to discussion from the floor were highly instructive to the members present.

It is largely through having talks such as this by men engaged in the production of metallurgical materials that the membership of the chapter can overcome the disadvantages of not having commercial manufacturing plants in Washington.

## INDEX TO VOL. 21 TRANSACTIONS

An index to Vol. XXI of *Transactions*, covering the twelve issues in 1933, has been prepared and is available to members of the Society at no charge on request to the National Office, 7016 Euclid Ave., Cleveland.



## Tillman D. Lynch

The death of Tillman D. Lynch, third president of the Society, in November came as a great shock to all who knew him. Below appear resolutions by the Board of Trustees of the Society and by the Pittsburgh chapter, with which Mr. Lynch was affiliated for so long.

### RESOLUTION OF SYMPATHY

Whereas, The Ruler of the Universe has, in His infinite wisdom, called from our midst Tillman D. Lynch and,

Whereas, Those who have been fortunate enough to meet and work with him during his outstanding service to mankind and industry learned to respect, admire and love him.

Therefore Be It Resolved: That as we mourn our great loss we be consoled by the thoughts of his life of splendid usefulness and meritorious achievements; that the officers, directors, and members of the American Society for Metals extend to Mrs. Lynch their heartfelt sympathy in her great bereavement; and that there may be preserved forever in the records of the Society a record of the members' appreciation and regard for its Third President, that these resolutions be made a part of the permanent record of the Society, that a copy be published in the Society's publications, and a copy sent to Mrs. Lynch.

Given under our hand this 19th day of January, 1934.

Officers and Board of Trustees  
AMERICAN SOCIETY FOR METALS.  
W. H. Phillips, President  
W. H. Eisenman, Secretary

Tribute of the Pittsburgh Chapter of the American Society for Steel Treating to our former member, friend and chairman, Mr. Tillman Davis Lynch.

Mr. Lynch was born in Clarksburg, West Virginia, September 5th, 1867. He attended West Virginia University, graduating in civil engineering, and was a member of Phi Sigma Kappa and Phi Beta Kappa. He was, also, a member of the Cadet Corps of West Virginia University, leaving with the rank of captain.

Mr. Lynch served as testing and inspecting engineer, G. W. Ferris & Company, Pittsburgh; assistant inspector of steel, Steam Engineering Bureau of the United States Navy. Since 1899 he was connected with the Westinghouse Electric and Manufacturing Company of East Pittsburgh, where he was manager of the materials and process engineering department. At the time of his retirement he held the position of consulting metallurgist.

He was the author of important technical papers presented before and published by the American Society for Testing Materials—of which Society he was President 1929-30, and the Engineering Society of Western Pennsylvania. Mr. Lynch was a member of both of the foregoing societies, as well as the American Society for Steel Treating of which he was a past president.

Mr. Lynch had won the respect and admiration of our members for his sterling character and friendly personality. His sound advice, cheerful disposition and wide experience made him one of our most valued members. To his near relatives we extend our sincere sympathy. In his passing away we feel a distinct loss, for we miss his presence, his wise counsel and his willing service.

Committee for the officers and members of Pittsburgh Chapter  
S. L. Goodale  
H. H. Ashdown  
H. L. Walker

## OFFER BOOKLET ON ZINC!

Members Can Get Free Copy By Writing To Society on Business Letter-Head

Something new in advertising literature has appeared which should be a valuable addition to the files of Society members. New Jersey Zinc Co. has recently published a beautiful booklet in four colors telling the story of zinc as a material from which a surprisingly wide range of products can be made.

This booklet is not a bulletin of technical data, but it is a new and interesting presentation of what zinc can do. Get a copy by writing at once on your company letter-head to American Society for Metals, 7016 Euclid Ave., Cleveland.

## MEMBERS' VOTE ADOPTS NAME AMERICAN SOCIETY FOR METALS

Constitution Changed Dec. 20

About noon on Dec. 20, 1933, by vote of the membership, the American Society for Steel Treating became the American Society for Metals. This new name polled 2½ times as many votes as the other on the ballot, with only a handful of votes being recorded as against any change of name.

The new name indicates no changes whatsoever in the aims and activities of the Society. It does mean that the Society's name is once again in harmony with its work.

In 1920 when the Steel Treating Research Society and the American Steel Treating Society amalgamated, no more suitable name than "American Society for Steel Treating" could have been chosen.

The succeeding years, however, brought such great advances in metallurgy and such broadening of the activities of the individuals in the Society that a change of name was indicated.

Dec. 20, besides marking the birth of the new name, also saw the adoption of several changes in the Constitution by an almost unanimous action on the part of the members voting. These constitutional changes, previously recorded in the REVIEW, relate chiefly to methods of nominating and electing officers of the Society.

## CHAPTERS SPONSOR COURSES IN METALS

Find that Classes Help to Increase Membership

Real contributions to their respective communities are being made by a number of chapters who are sponsoring educational courses of one type or another this season.

Boston has started a course of 17 lectures covering a wide range of metallurgical topics. Professors Waterhouse, Homerberg, Norton, Williams and Zimmerman of M. I. T. each give one group of lectures. The course is free to members, \$10 to non-members, and has brought quite a number of new members into the fold.

Cleveland has already completed a valuable course in weld design and production, and another on applied metallurgy is just about to start. R. E. Kinkead gave the welding course, and Harry B. Pulsifer will conduct the latter. Cleveland chapter has an excellent record in adding members through its courses.

Hartford's metallurgical course is presented simultaneously in Hartford, Bristol, New Britain, Meriden and Torrington, with Ray Woodward, Lester Lanning, Carl Hewitt, William Steinreich and George Wilcox conducting in the respective cities. All groups will join to hear the last three lectures delivered by David Tamor, D. K. Crampton and F. P. Gilligan.

New Jersey's courses are described on page 6 of this issue.

In addition to a full size course sponsored by the chapter at Temple University, Philadelphia, is also giving a "pocket edition" course of six lectures designed for busy men. It is likewise free to members. Dr. T. H. Nelson, W. J. Diederichs, Dr. H. C. Boynton, F. B. Foley, Dr. Haakon Styri and N. L. Mochel will each give one lecture.

York's three-year course was described in the last issue, but these corrections must be made: The Division of Mineral Industries Extension of Pennsylvania State College is cooperating with the chapter, and the credits offered for completion of the course do not count towards a college degree.

Other chapter courses previously described in the REVIEW are sponsored by Chicago, Detroit and Golden Gate. These are the only ones on which National Headquarters has definite information. We would like to hear of any others.

## NEW HANDBOOKS!

Members in good standing who have not yet received their copy of the new National Metals Handbook may do so by sending in their copy of the 1930 Edition to the National offices, 7016 Euclid Ave., Cleveland. A copy of the New Edition will be sent immediately in exchange.

## CONVENTION WILL BE HELD IN NEW YORK, OCTOBER 1-5

Port Authority Building Will House Exposition

On to New York!

For the first time the National Metal Congress and Exposition will be held in New York City. The week of Oct. 1, 1934, has been selected as the date, and Commerce Hall in the Port of Authority Bldg., at 14th and Eighth Ave., has been chosen for the site of the Exposition. Hotel headquarters will be announced later.

The Board of Trustees of the Society made these decisions at their latest meeting on Jan. 18.

The great show staged in New York recently by the Ford Motor Co. was held in this building, which proved exceptionally satisfactory for exhibition purposes.

All exhibits will be located on one floor, with 160,000 square feet of space available. There will be no restrictions as to floor loading or operation of exhibits.

"We have long wanted to have the Congress and Exposition in New York," W. H. Eisenman, Secretary of the Society said, "but until now no suitable building has been available."

"Definite arrangements have been made that rates for services and connections will be the same as those which our exhibitors have enjoyed in Cleveland, Detroit and elsewhere."

"Now for the first time the Exposition and meeting can be comfortably held in the city which is the center of a great industrial section and in which such a great part of the nation's industrial purchasing and executive power is concentrated."

Floor plans will be available about March 15.

## CREEP TESTS ARE FOLEY'S SUBJECT

New York Hears Good Talk at Meeting on Nov. 21

By F. H. Clark

The New York chapter instigated a new custom by meeting on Nov. 21 at the American Society of Swedish Engineers. Dinner was served in the very attractive club house and the chapter was most fortunate in having W. H. Eisenman present to say a few words of greeting.

F. B. Foley, Midvale Co., spoke on "Recent Developments in Creep Testing and High Creep Steels." He began by stating that there are three temperature ranges in creep testing suitable for different steels: (1) 850-900° F. where pearlitic steels may be used; (2) 900-1200° F. for low alloy steels in the pearlitic range and (3) above 1200° F. for high alloy austenitic steels. In the first class, the pearlitic steels undergo certain changes during creep testing due probably to strain hardening which confuses the results and may not be creep in the proper sense. In the other two classes, creep is an important factor as well as scaling.

In creep testing, structural stability must be attained prior to testing so that prolonged annealing followed by drawing at 1200° F. is recommended.

Mr. Foley believes that creep in the strain hardening range may be estimated in a short time test. The elastic limit of steel exists at least up to 200° F., but where creep begins is indefinite. It is of more importance to determine this latter factor than to extrapolate creep data to 100,000 hours where actual tests of only 200 hours have been carried out.

## KEN BRIGGS HAS NEW POSITION

The many friends of H. Kenneth Briggs, who was assistant secretary of the Society until Nov., 1932, will be interested to learn that he has been appointed assistant to the chairman of the Drag Line and Crane Institute. Ken now has his offices in the Bucyrus-Erie plant in South Milwaukee.



# THE REVIEW

Devoted to the interests of the American Society for Metals

A Review of the Activities of the Chapters and National Organization

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W. H. PHILLIPS, President  
EMIL GATHMANN, Treasurer  
W. B. COLEMAN, Director  
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E. C. BAIN, Director

W. P. WOODSIDE, Director

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RAY T. BAYLESS ..... Editor  
JOHN G. MAPES ..... Managing Editor

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## BOSTON MEN VISIT ARSENAL; HEAR INTERESTING PAPERS

A. W. S. Swells Total to 750

By Howard E. Handy

Nearly 750 attended the joint meeting of the Boston chapter and the Boston section, American Welding Society, held at the Watertown Arsenal, on Nov. 3. During the afternoon the group, as guests of Lt. Col. G. F. Jenks, Commanding officer, visited the various departments of the Arsenal.

Dinner was then served in the dining hall to some 300 persons, music and entertainment being furnished by the Arsenal.

The evening meeting was presided over by E. L. Bartholomew, chairman of the chapter, who introduced the various representatives of the A. W. S. and the Arsenal. Lt. Col. Jenks described the development and function of the Watertown Arsenal, after which two of his assistants presented interesting papers. W. L. Warner, welding engineer, talked on the "Welding of Nickel Steel," and Lieut. S. L. Connor, foundry engineer, reviewed the experience of the Arsenal on the "Centrifugal Casting of Guns."

Col. Jenks then presented some very interesting illustrated figures covering the heat treatment and physical properties of centrifugal gun castings and also gave comparative figures on the same type of guns made by other processes.

## SOCIETY ADDS TO SURPLUS

Treasurer Gathmann Reports Net Profit of \$8,630.88 for Past Year

One of the highlights of the recent meeting of the Board of Trustees was the report of the Society's financial condition.

Treasurer Gathmann reported that the Society operated in 1933 with an excess income of \$8,630.88 over expenses, and that that amount had been added to surplus.

[The audited financial statements will be published in a later issue.—Editor.]

## WORCESTER MEETS DEC. 14

Stanley P. Rockwell Tell Some of Commercial Steel Treater's Woes

By R. R. Tatnall

The December meeting of Worcester chapter was held on the 14th, with dinner at the Bicknell Manor. Stanley P. Rockwell, of the Stanley P. Rockwell Co., Hartford, gave a talk on "The Troubles of a Commercial Heat Treater."

He traced the influence of design in heat treating troubles, and showed a number of samples illustrating faults which were caused, not by the heat treater, but either by faulty steel or poor design. A lengthy discussion was started when he showed data on the abnormality of wire parts to be hardened, in which the abnormality was found to be closely related to the copper content of the material.

## MEETING OF BOARD

Continued from Page One

Tri-City chapter; Robert Sergeson, Canton-Massillon chapter, Chairman (one year).

Upon motion by Mr. Shepherd, seconded by Mr. Bain and unanimously carried, these committee appointments were approved.

President Phillips then presented the following nominations for membership on the Recommended Practice Committee: To be chairman, Dr. Charles F. Herty, Jr., Pittsburgh chapter (one year); J. P. Gill, Pittsburgh chapter, Member (3 years).

Upon motion by Mr. Archer, seconded by Mr. Gathmann and unanimously carried, the above appointments were confirmed.

Upon motion by Mr. Archer, seconded by Mr. Coleman and unanimously carried, President Phillips' nominations for membership on the by-laws committee were confirmed as follows: Clyde Williams, Columbus chapter (3 years); John R. Long, Dayton chapter (3 years).

Mr. E. C. Bain representing the board of trustees on this committee, as required by the constitution.

Upon motion by Mr. Shepherd, seconded by Mr. Archer and unanimously carried, Walter Mathiesius, Chicago chapter, and George R. Norris, New York chapter, were confirmed as members of the finance committee (3 years each), upon the recommendation of the President.

The 1933 and 1934 financial conditions were then presented to the board by Treasurer Gathmann, chairman of the finance committee. The report is as follows:

"Minutes of the Meeting of the Finance Committee National Headquarters Jan. 17  
Present: Emil Gathmann, Chairman  
W. H. Phillips  
W. S. Eide  
W. H. Eisenman  
Zay Jeffries

"The chairman presented 12 pages of financial statements for the year 1933. Each one of these items was taken up separately, its features discussed, and appropriate action taken."

"Mr. Hay of the trust department of the Cleveland Trust Company joined the finance committee in consideration of the investments. "It was moved by Dr. Jeffries, seconded by Mr. Phillips and unanimously carried that they should recommend to the board of directors that they should accept plan No. 1 for the exchange of the Associated Gas and Electric Co. bonds as recommended by the trust officers of the Cleveland Trust Company."

"After further consideration of the other items of investment, it was moved, seconded and unanimously carried, that the finance committee should recommend to the board that they were in accord with the suggestions of the Trust Company that no changes should be made in the list of investments as at present."

"Upon motion made, seconded and carried, the advertising accounts receivable, the inventory, the income and expense accounts, and the income and expense accounts for the Detroit convention were approved for presentation to the board of trustees."

"Upon motion properly made, seconded and unanimously carried, a budget was prepared and recommended for adoption by the board of trustees."

"Upon motion properly made, seconded and unanimously carried, a budget of the convention was prepared and approved for presentation to the board."

"Upon motion properly made, seconded and unanimously carried, uncollected accounts to the amount of \$63.35 were written off."

"Upon motion properly made, seconded and unanimously carried, it was voted to recommend to the board that the depreciation on furniture and fixtures for the year 1933 be set at 10% of the valuation."

"Upon motion properly made, seconded and unanimously carried, the meeting adjourned."

After the presentation of Mr. Gathmann's report, and after consideration of each page of the financial reports in the most careful manner, it was moved, seconded and unanimously carried that the financial report as submitted by the treasurer, upon the recommendations of the finance committee, be approved by the board.

Treasurer Gathmann then proceeded with the presentation of the budget prepared by the finance committee, and that business continued for a considerable time when it was decided that this matter should be delayed temporarily and consideration given to the selection of a convention city for 1934.

The secretary then presented a report on cities for the National Metal Exposition and Congress.

Mr. Lincoln Dickey, managing director of the New York Convention and Visitors Bureau, appeared before the trustees and presented facts and information relative to the facilities of New York for entertaining the 1934 convention and exposition. He presented to the trustees confirmational communications, giving prices for rent, electrical connections, etc., and other information which was necessary for them to have before a proper decision could be made.

The trustees gave the question of the location of the 1934 exposition very careful consideration, and upon motion by Mr. Shepherd, seconded by Mr. Coleman, and unanimously carried, it was resolved that the 1934 convention and exposition of the Society should be held in New York City, provided the secretary of the Society was able to complete satisfactory arrangements.

The board of directors then returned to the consideration of the budget, but its final adoption was left as an item of unfinished business for the next session.

Upon motion properly made, seconded and unanimously carried, the board adjourned until the next day.

## Adjourned Meeting BOARD OF TRUSTEES Jan. 19, 1934

The consideration of the budget was completed as the first order of business, and upon motion by Mr. Coleman, seconded by Mr. Shepherd, the budget as submitted by the finance committee was approved.

The secretary then presented a report requesting authority from the board to hold educational courses during the 1934 convention. It was moved by Mr. Shepherd, seconded by Mr. Bain and unanimously carried that the board approve the presentation of lectures on the subject of the fundamental and practical side of metals.

It was moved by Mr. Shepherd, seconded by Mr. Gathmann and unanimously carried that the president appoint a sub-committee of the board to determine the subjects to be presented and the lectures and other details connected with the presentation of these lectures and report to the trustees.

The president appointed a committee consisting of Eisenman, Bain and Archer.

Consideration was given to the publication of the general index of the publications of the Society covering the period from 1925 to 1932 inclusive, and upon motion by Mr. Coleman, seconded by Mr. Archer and unanimously carried, the secretary was authorized to proceed with the publication of the general index to be sold at a prepublication price of \$1.25 and a regular sale price of \$2.00.

Upon motion by Mr. Shepherd, seconded by Mr. Archer and unanimously carried, Mr. Harry McQuaid was selected as the Campbell Memorial Lecturer for 1935.

It was moved by Mr. Shepherd, seconded by Mr. Coleman and unanimously carried that a sub-committee of the board be appointed to draw up rules and regulations governing the creation and awarding of a medal by the Society in recognition of creative achievements along the aims and purposes for which the Society had been established.

President Phillips appointed Mr. Shepherd, Mr. Keshian, Mr. Coleman as members of that committee.

Upon motion properly made, seconded and unanimously carried, resolutions of regret upon the death of Mr. T. D. Lynch, past president of the Society, were adopted.

Upon motion by Mr. Eisenman, seconded by Mr. Coleman and unanimously carried, the Baltimore group of the Society was advanced from a group standing to that of a chapter.

Mr. Archer presented a report on behalf of the committee, composed of Mr. Norris, Mr. Eisenman and Mr. Archer, that had been in conference with a similar committee of the American Institute of Mining and Metallurgical Engineers in order to determine, if possible, a distribution of subject matter so that there would be less overlapping of printed reports.

It was the general opinion of the committee that there was very little that could be accomplished in drawing divisional lines of activity at the present time, but the general discussion was such that the committee may at some later date be able to accomplish results. Consequently, the president, with the permission of the board, continued this committee.

The secretary presented written reports on the Recommended Practice Committee and Publication Committee, showing the status of the work of these committees at this time.

Upon motion properly made, seconded and unanimously carried, the meeting adjourned.

## PALMER TELLS CLEVELAND MEN ABOUT TORSION IMPACT TESTS

Mill Visited in Afternoon

By Harry B. Pulsifer

A record was set for the Cleveland chapter on Nov. 13 when 96 gathered at the tables in the Cleveland Club to hear Frank R. Palmer of the Carpenter Steel Co.

A rather full program was carried out on that afternoon and evening. In the afternoon nearly 200 members and guests, visiting the Riverside works of the Otis Steel Co., were especially interested in the continuous strip mills. The open hearth department, continuous pickling and heating units also received much attention.

For the technical session after a dinner Chairman Van Horn presented E. E. Thum, editor of *Metal Progress*, who presided as technical chairman during the address of Mr. Palmer and the discussion that followed. Mr. Palmer's address followed closely the papers on torsion impact testing as presented by other Carpenter metallurgists at the Chicago A. S. T. M. meeting and the Detroit A. S. S. T. convention.

The perfect development of the subject and thorough technical knowledge of Mr. Palmer made a discourse well worth listening to. Mr. Thum then started some little discussion with questions of his own and finally had J. V. Emmons, Cleveland Twist Drill Co., explain the significance of the static torsion test of hardened tool steels.

## RASSBACH SPEAKS ON ELECTRIC STEEL

Philadelphia's Meeting on  
Jan. 5 Proves Popular

By Adolph O. Schaefer

Philadelphia's regular December meeting, postponed to Jan. 5, to leave room for Christmas and a Smoker, started the New Year off with a lively interchange of conflicting viewpoints.

The program for the season is in the form of a planned sequence of talks covering the broad fundamentals of steel manufacture and fabrication. The sequence thus far had reached the subject, "Electric Furnace Steels." The speaker on this subject was H. P. Rassbach of the Midvale Co.

Mr. Rassbach's most comprehensive talk included, first, a discussion of electric furnace steels from a metallurgical standpoint. After a consideration of the economic reasons for the use of the process, the speaker described the various types of equipment in use.

The main portion of the talk was given to a description of the details of the melting process in the electric furnace as applied to various types of alloys.

The discussion following the talk brought out several features. One is that there is considerable interest in different types of equipment, and the reasons for the same. This was manifested by many questions about high frequency melting furnaces, and about methods of charging arc furnaces.

The discussion finally gravitated into a heated debate between two groups of melters who disagreed fundamentally on the relative merits of pig iron and coal for recarburizing. When this point was reached, the meeting was adjourned to allow the combatants free use of the arena.

## YORK MEN EAGERLY DISCUSS TOOL STEEL

J. P. Gill's Talk in December  
Leads to Many Queries

By F. J. Allen and G. J. O'Neill

The December meeting of the York chapter was held in the Brunswick Hotel, Lancaster. The lecture on tool steels by J. P. Gill, of the Vanadium-Alloys Steel Co., was preceded by a dinner at which the coffee talk was given by F. J. Heckman, teacher of English in the Lancaster High School.

The discussion which followed Mr. Gill's interesting talk showed the attention and the wide range of the individual interests of the members.

Carl G. A. Schmidt, assistant equipment engineer, of the Pennsylvania State Department of Highways, raised the question of material for the jaws of different types of rock crushers. The remarks contributed by Mr. Schmidt and discussed by Mr. Gill and others were decidedly interesting. Mr. O'Neill raised the question of the suitability of tantalum carbide for drawing dies for gold wire. Mr. Gill's opinion was favorable to this application.

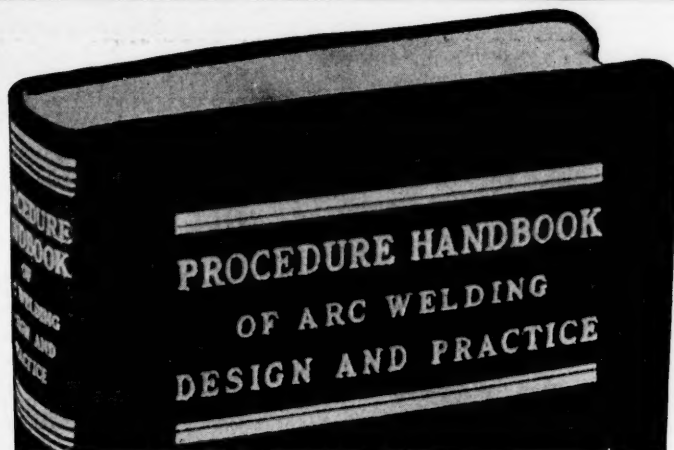
This led to a discussion initiated by Mr. Shubrook of the Hamilton Watch Co. of engraving dies for such fine work as done on silver and gold watch cases. Mr. Shubrook's experience in this work made his contribution of value and the discussion with the lecturer seemed to leave the balance of opinion in favor of a straight tool steel for this purpose.

Mr. Yahn of the Armstrong Cork Co. brought up the old question of the best general purpose tool steel for a shop of relatively small and varied production. The meeting fully agreed with Mr. Gill's closure of this question that the definition of "general purpose" varied for shop to shop and consequently the question must be decided on the merits of each particular case. Mr. Warren of the Mac-It Parts Co. introduced the question of the use of tantalum carbide for stainless steel on a production basis.

Mr. Gill showed the same thorough knowledge of his subject in handling the discussion as he did in the presentation of his lecture. This was quite one of the finest meetings York chapter has held, and the chapter's thanks are due the Lancaster members for organizing the gathering.

## H. W. McQUAID JOINS REPUBLIC

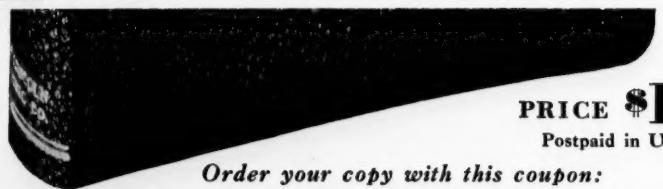
Harry W. McQuaid has joined the metallurgical staff of Republic Steel Corp. Mr. McQuaid, internationally known as an authority on carburizing steels and case-hardening methods, is a pioneer in grain size control and collaborated in the development of the McQuaid-Ehn test which bears his name. He will devote his time with Republic to research and development work.



This is the most complete handbook ever published on the subject of the art of arc welding, its applications and design procedure for the most efficient use of the process. It is a compendium of pertinent information and accurate data prepared for the use not only of all welders and users or prospective users of the electric arc process of welding, but also for those responsible for the design of products which may be built by welding.

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## TALK ON MACROSTRUCTURE IS ENJOYED BY ONTARIO CHAPTER

Bernard Collitt Speaks Nov. 10

By John W. McBean

On Nov. 10 Ontario chapter met in Hamilton, with the usual good attendance.

The technical paper was given by Bernard Collitt, metallurgist for Jenkins Bros., Montreal, on "Metallography without a Microscope." A full report of Mr. Collitt's excellent talk on the same subject before another chapter appeared in the May, 1933, issue of the REVIEW.

At the close of the paper J. G. Morrow gave some information about the use of the macro-etch by The Steel Company of Canada, and O. W. Ellis, Ontario Research Foundation, gave some further examples of the use of the etch on brass and bronze and ex-

plained that in some instances a pointed tool with a fine feed in a shaper would give a good picture of the crystal structure of bronze without etching.

The unanimous decision of the meeting was that we should be delighted to have Mr. Collitt give us another paper.

The attendance prize was given by the Canadian Westinghouse Co., and in the drawing it fell to Mr. Ellis, which pleased the rest of us as much as it did him.

### R. A. BULL NOW AJAX CONSULTANT

Ajax Electrothermic Corp. announces that R. A. Bull will devote part of his time as its consultant and mid-west representative, maintaining his office at 541 Diversey Parkway, Chicago. Major Bull will continue his work as a consultant on steel castings. Major Bull was director of the Electric Steel Founders' Research Group during the 13 years of its existence. He is an active member of Chicago chapter of the Society.

## TOOL STEELS ARE CHOSEN BY ROCKFORD AS MEETING TOPIC

A. J. Scheid, Jr., is Speaker

By Freeman G. Anderson

A. J. Scheid, Jr., metallurgist and superintendent of melting at Columbia Tool Steel Co., presented a paper on "Factors Affecting Tool Steel Performance," at the Dec. 15 meeting of Rockford chapter.

[This most interesting talk was reported in the November, 1933, issue of the REVIEW, and hence will not be abstracted here at this time.—Editor.]

Considerable discussion followed this talk. Interest was shown in the new treatment for high speed steel die "double drawing." After hardening and drawing in the usual way Mr. Scheid supported the belief that another low draw to a temper blue after grinding produced beneficial results.

## RADIOGRAPHY TALK BY NORTON INTERESTS RHODE ISLAND MEN

X- and Gamma Rays Covered

By Walter M. Saunders, Jr.

At the November meeting of the Rhode Island chapter, held in the Engineering Building at Brown University, Prof. John T. Norton, associate professor of the physics of metals at the Massachusetts Institute of Technology, described in a very interesting and entertaining way, "X-Rays and Gamma Rays in Industry."

Prof. Norton's talk was devoted to uses of these rays in the examination of metals.

Defects in castings, both ferrous and non-ferrous, and examination of welds, were two subjects covered in detail. Other points of interest were the cost of taking radiographs, obsolescence charges on equipment, precautions in

using X-rays, the thickness of metals able to be penetrated by X-rays and gamma rays, and a brief comparison between these rays, with respect to the limitations of each.

Although the short time would not allow a lengthy description of the use of X-rays for diffraction patterns, Prof. Norton described the general method of procedure, and stated that X-rays, used in this way, furnished the metallurgist, engaged in research, probably the most useful tool yet devised.

It was an enjoyable meeting, and an honor to have Prof. Norton with us.

### JAMES H. GIBBONEY IS DEAD

James H. Gibboney, who as a member of the Recommended Practice Committee of the Society from 1927 to 1929, participated in the preparation of the 1929 edition of *Metals Handbook*, died recently at Roanoke, Va., following an operation. Since 1906 Mr. Gibboney had been chief chemist for the Norfolk and Western Railway.

# ASK FOR THESE FREE PAMPHLETS

### Furnace Protector

A new device to protect all types of heating equipment and the charge itself from overheating during operation has been perfected by Hevi-Duty Electric Co. and is described in a recent publication. This novel excess temperature cut-out eliminates need for fuses. Bulletin Jr-44.

### Heat Treating Machine

A new continuous machine for heat treating in gas atmospheres is described in an American Gas Furnace Co. bulletin. A variety of treatments can be performed in this machine by passing different atmospheres through the muffle. Description of this machine is complete and interesting. Bulletin Jr-11.

### Electric Melting News

A unique résumé of each month's news about electric melting, high strength cast iron, etc., is published by Detroit Electric Furnace Co. It is an illustrated compilation of extracts from trade magazines. Busy men find it valuable and easy to read. Get on the monthly mailing list. Bulletin Jr-98.

### Properties of Stainless

Ludlum Steel Co. describes the several analyses of Silchrome corrosion and heat resisting steels in a new data sheet. Physical properties are given for each type, as well as a summary of general characteristics. Bulletin De-94.

### New Electric Furnace

Bellis Heat Treating Co. has developed a revolutionary type of electric pot type furnace for hardening carbon, alloy, or high speed steels, bright annealing, cyaniding, and tempering. An illustrated folder explains the many advantages which their new heating principle makes possible. Bulletin Jr-48.

### Stainless Steel Facts

Designed in convenient file folder format, the new Carpenter Steel Co. booklet, "Working Data and Technical Facts on Stainless Steels," contains a wealth of valuable facts on Carpenter stainless steels. An ingenious system classifies the various analyses into three easily identified types. Bulletin De-12.

### Atmosphere Furnaces

An interesting folder of Surface Combination Corp. gives performance data on their atmosphere furnaces compiled from installations in actual production. Operations described include bright annealing of ferrous and non-ferrous metals, carburizing, nitriding, forging without scale and hardening without scale. Illustrated. Bulletin De-51.

### Nickel Alloy Steels

A recent folder of International Nickel Co., a reprint of a Bureau of Standards publication, explains the effects of adding nickel to steel and emphasizes the physical and mechanical properties of the commonly used nickel steels. Curves and tables illustrate. Bulletin De-45.

### Welding Rods

Linde Air Products Co. has published an attractive book which describes in clear, non-technical language the properties, characteristics, and uses of every type of Oxweld welding rod. A fund of reliable general information on welding rods is an important feature of the book. Bulletin Jr-63.

### Carburizing Steel

An interesting booklet prepared by Union Drawn Steel Co. describes its Union Special carburizing steel and includes interesting records of tensile, hardness, bend, impact and crushing tests made with this steel in direct comparison with S.A.E. 1015 after various types of heat treatments. Bulletin Jr-83.

### New Hardening Method

All three vital factors in correct hardening are completely controlled by the new Vapocarb Hump method of hardening, which is well described in a Leeds & Northrup bulletin. The three factors are: Quench point, rate of heating, and furnace atmosphere. Complete details are given in Bulletin No-46.

### Hardness Testing

Everyone interested in the testing of metals for hardness will do well to have on hand a copy of a catalog recently issued by Wilson Mechanical Instrument Co., illustrating and describing the latest designs of Rockwell Hardness Testers and auxiliary work supports. Bulletin Sp-22.

### New Indicating Pyrometer

The new indicating pyrometer of Foxboro Co. is described in a recently issued folder which gives full details of its construction and accurate operation. The potentiometer system of temperature measurement is employed. A feature is the placing of all adjustments on the front cover plate. Bulletin Jr-21.

### Carburizing Boxes

Driver-Harris Co. devotes a folder to a description of Nichrome cast carburizing boxes. Physical properties at room temperature and under operating conditions are given, as is a list of the advantages of Nichrome castings for such service. Bulletin Jr-19.

### Melting Furnaces

Pittsburgh Lectromelt Furnace Corp. offers a folder describing its line of new top-charging melting and refining furnaces. Economics of top-charging are analyzed and much information on operation and construction is given. Capacities range from 50 lb. to 50 tons. Bulletin Jr-18.

### Welding Stainless

Republic Steel Corp. has assembled a wealth of practical information on the welding of their Enduro stainless steels and incorporated it in an excellent booklet. Full information is given on joining stainless by the various welding processes. Bulletin Jr-8.

### Bright Annealing

A publication of Electric Furnace Co. describes new developments in controlled atmosphere furnaces for continuous deoxidize annealing, bright normalizing and bright annealing both ferrous and non-ferrous metals. Sheets, strip, coils, tubing and wire come clean, bright and dry from these furnaces. Bulletin No-30.

### New Furnace Blowers

Two new types of Turbo-Compressors are described in recent publications of Spencer Turbine Co. Uses for the  $\frac{3}{4}$  hp. Turbo are presented, as is a description of the new single stage Turbo-Compressor which affords tremendous economies in low pressure gas and oil fired equipment. Bulletin Sp-70.

### New Pyrometer Manual

Brown Instrument Co. has prepared an elaborate manual on the use of their potentiometer pyrometer which describes 50 exclusive features which are important to the technical man and practical to the shop man. The book will greatly interest those who must maintain accurate temperature. Bulletin Jr-3.

### Electric Furnaces

Furnace users will find much valuable information in a recent publication of General Electric Co. which describes the construction and operation of G. E. electric furnaces. Many photographs, charts and drawings and a well written text make this booklet both interesting and instructive. Bulletin Jr-60.

### Coated Electrodes

Murex heavy mineral coated electrodes are the subject of a well-conceived booklet prepared by Metal & Thermit Corp. Emphasis is laid on the metallurgical merits of a heavy, all-mineral coating. Many practical hints on welding are included. Bulletin Jr-64.

### Heat Resisting Alloys

Authoritative information on alloy castings, especially the chromium-nickel and straight chromium alloys manufactured by General Alloys Co. to resist corrosion and high temperatures, is contained in one of that company's publications. Bulletin D-17.

### Cyanide Baths

Much practical information on the heat treatment of steels with cyanides and salts is contained in a descriptive booklet of E. I. duPont de Nemours & Co., R. & H. Chemicals Dept. The booklet contains many valuable suggestions for improved quality heat treating. Bulletin Sp-29.

### Optics in Metallurgy

A surprisingly large number of uses for optical instruments in metal working are described in a new booklet of Bausch & Lomb Optical Co. Photomicrography is, of course, prominent among these, but this well illustrated booklet shows many other interesting optical instruments. Bulletin No-35.

### Beryllium-Copper

Beryllium-Copper is a relatively new alloy produced by American Brass Co. which can be heat treated to tensiles as high as 181,000 lb. per sq.in. It is supplied in sheets, wire, rods, tubes and forgings. An excellent booklet gives full information on fabrication and treating. Bulletin No-89.

### To Prevent Rust

The well known rust preventive, No-Ox-Id, is now available from Dearborn Chemical Co. as a foundation for paint. It is available in the colors red, gray or black. A booklet explains how maximum resistance to corrosion can be obtained. Bulletin Ju-36.

### Induction Furnaces

A publication of Ajax Electrothermic Corp. tells of the development, operating principles, applications, and advantages of commercial Ajax-Northrup coreless induction furnaces energized by motor generator sets. Also information regarding standard sizes of motor generator sets and furnaces. Bulletin Jr-41.

### New Zinc Coating

Wire which has been zinc coated by the new Bethanizing process is described in Bethlehem Steel Co.'s latest folder. This process produces a zinc coating which has proved to be more ductile, tighter, tougher, more uniform and purer. Coatings 3 times as heavy as formerly can be made. Bulletin Au-76.

### Hardening High Speed

Spoilage is eliminated when high speed steel is hardened in Certain Curtin electric furnaces, claims a new booklet issued by C. I. Hayes, Inc. Grain growth is controlled and the most delicate tools develop maximum hardness without decarburization, scaling or fusing. Bulletin No-15.

### Uses of Molybdenum

Climax Molybdenum Co. offers a new and useful 50-page booklet dealing with the benefits conferred by molybdenum as an alloying element in iron and steel. In orderly fashion engineering data are presented and made clear with numerous tables and illustrations. Bulletin Au-4.

### Cast Vanadium Steel

Jerome Strauss and George L. Norris have written a technical booklet for Vanadium Corp. of America describing the properties developed by steel castings containing various percentages of vanadium. The information given is complete and authoritative. Bulletin S-27.

### X-Rayed Alloy Castings

A folder just issued by Electro Alloys Co. describes their X-Ray inspection service of Thermalloy heat resisting castings for high temperature work. Considerable data on the use of X-Ray tubes and "radon" capsules to check foundry practice are presented. Typical radiographs and tables of physical properties are included. Bulletin Oc-32.

### Aluminum vs. Corrosion

In the carefully prepared booklet, "Combating Chemical Corrosion with Alcoa Aluminum," published by Aluminum Co. of America, effects of various corrosive agents upon aluminum and its alloys are described in detail. It is an excellent and convenient source of information on this subject. Bulletin Sp-54.

### Darkfield Microscopy

Comparison is made of darkfield and brightfield metallographic examination in a 16-page publication of E. Leitz, Inc. The equipment necessary for darkfield microscopy is described and prices are given. Several sets of micrographs of the same field contrast the two methods of illumination. Bulletin Ja-47.

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Please have sent to me, without charge or obligation, the following literature as described in the January issue. (Please order by number.)

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## NEW JERSEY HEARS TALK ON CASTINGS

Major R. A. Bull is Speaker at Big Meeting on Dec. 11

By Ernest O. Olds

A joint meeting of the New Jersey chapter with the American Foundrymen's Association was held Dec. 11, at the Elks' Club.

In opening the meeting, at which over 150 were present, our chairman, Mr. Frazer, extended a most cordial welcome to our guests of the A. F. A. and also to the members of the course in heat treating being sponsored by our chapter in co-operation with the vocational High School. In response, the secretary of the A. F. A., J. L. Carter, expressed the great appreciation of his association, in being present.

Our guest speaker of the evening was Major R. A. Bull of Chicago, an outstanding expert on steel casting. His talk was on "Recent Developments in Steel Castings."

Major Bull told us of the metallurgical developments of the past five years—how certain steel castings now had tensile strengths from 50,000 to 225,000 lb. per sq. in. At present there are eight grades of steel castings which under the new specifications call for a minimum yield point of about 75,000 lb., an ultimate tensile strength up to 150,000 and an elongation of 25%. These various grades are not identified by any definite chemical composition, however.

In closing, Major Bull pointed particularly to the great advantage of steel castings to be found in the very wide range of physical properties, available to the engineer, through proper heat treatment.

A general discussion followed in which several participated, including our chairman, Dr. Frazer and J. S. Vanick of the International Nickel Co. Major Bull further said that he usually considered a composition of an alloy having more than 0.50% carbon as cast iron and a composition having from about 0.18-0.45% carbon as a cast steel.

### SMALLEY TALKS AT DAYTON

Dayton S. A. E. Section Joins Chapter at Good Meeting on Nov. 13

By F. M. Reiter

A joint meeting of the Dayton chapter of Society of Automotive Engineers and the American Society for Steel Treating was held on Nov. 13.

The speaker of the evening was Oliver Smalley, technical director of the Gray Iron Institute of America, and president of the Meehanite Metal Corp. of Pittsburgh. Mr. Smalley gave a very fine talk on the fundamentals of the cast iron materials, their properties and requirements, picturing the possible developments of high strength cast irons. Curves, photomicrographs and samples illustrated his talk.

After his talk a lively discussion followed of the problems and use, heat treatment and processing of all types of irons, including alloy and high test irons. About 75 men were present, who expressed their appreciation for the educational merit of the evening's meeting.

### FORM BRISTOL CO. OF CANADA

Bristol Co., Waterbury, Conn., announces that to serve the Canadian market still better and to expand and consolidate its present Canadian service laboratory of 12 years standing so as to include sales, service and manufacturing, a separate company, the Bristol Co. of Canada, Ltd., has been incorporated. Factory and general headquarters will be located at 64 Princess St., Toronto, Ont., where Bristol recording, indicating and control instruments will be made.

## POWDERED METALS THEME OF NOV. MILWAUKEE MEETING

W. P. Sykes Gives Good Talk

By W. E. Jominy

"Powder metallurgy" was the subject of an ably presented talk by W. P. Sykes at the November meeting of the Milwaukee chapter. Mr. Sykes described the manufacture of tungsten lamp filament from tungsten oxide and told of some of the more recent applications of metal powders.

Regarding the principles of powder metallurgy, Mr. Sykes said, "It has been well established that for one class of material at least the following relations hold:

(1) A fine oxide produces a fine metal powder and conversely, a coarse oxide results in a coarse metal powder under like conditions of reduction. (2) A metal powder of small particle size tends to produce a treated bar of relatively large grain size, while the coarser metal powder results in a smaller grain size.

Generally speaking the best working properties are obtained in a metal which had a maximum in particle size at about 0.010 mm.

By application of powder metallurgy, alloys have been made for welding contacts, die and cutting tools and self-lubricating bearings.

## HEAR RESULTS OF $A_{c3}$ POINT STUDY

R. R. Abbot Talks at Joint Meeting in Cleveland

By H. B. Pulsifer

Colonel Robert R. Abbott of the White Motor Co. presented a remarkable paper at a joint meeting of the Cleveland chapters of the A. S. S. T. and the S. A. E. on Dec. 11. From thousands of analyses on 400 steel bars, Col. Abbott has worked out the precise effect of alloying elements on the upper critical temperature. This allows him to prescribe the temperatures for heating to quench from the chemical analysis of any given steel.

The work was carried out in an astonishingly complete and precise manner. Samples were collected from world-wide sources. Treatments and analyses were exhaustive. The mathematical corrections were carried to the limit. The results are probably the most accurate and comprehensive of any similar work ever done on steel.

Colonel Abbott very concisely related the steps taken to insure precision and reliability. The final results were summarized as follows:

1.  $A_{c3}$  for pure iron is 908° C.
2. 0.01% carbon lowers  $A_{c3}$  by 2.237° C.
3. 0.001% phosphorus raises  $A_{c3}$  by 0.4385° C.
4. 0.01% silicon raises  $A_{c3}$  by 0.3049° C.
5. 0.01% vanadium raises  $A_{c3}$  by 0.3792° C.
6. 0.01% manganese lowers  $A_{c3}$  by 0.3443° C.
7. 0.01% nickel lowers  $A_{c3}$  by 0.23° C. but increases it by 2 (C — 54 + .06 Ni) provided the quantity in the bracket is pos.)

### O. W. McMULLAN IS PROMOTED

O. W. McMullan has been appointed chief metallurgist of Timken-Detroit Axle Co. For the past nine years, Mr. McMullan has been assistant chief metallurgist, in charge of research and improved practice at Timken.

He is a member of the executive committee of the Detroit chapter and is the author of six text books on heat treatment and metallurgy, as well as a number of papers read before the Society.

## CINCINNATI PICKS NON-FERROUS TOPIC

J. R. Freeman, Jr., Speaks on Copper at December Meeting

By N. C. Strohmeier

At the December meeting of Cincinnati chapter on Dec. 13, J. R. Freeman, Jr., research metallurgist, American Brass Co., Waterbury, Conn., spoke on "Copper and Copper Alloys." A valuable discussion which covered the following questions and answers:

Q—Can pure copper or commercial copper be welded? A—Yes.

Q—Have we lost the art of hardening copper? A—No, we know as much about hardening copper today as they did several thousand years ago.

Q—Is copper tubing brittle? A—No, repeated stress upon it is usually responsible for failure.

Q—Are copper alloys used for gears? A—No, too costly.

Q—What is "red" brass? A—Most likely 85% copper and 15% zinc.

Q—Do you add beryllium to resist abrasive wear? A—Yes, since it increases the hardness which resists this kind of wear best.

Q—Are the physical properties on wires of beryllium copper the same as on larger sections? A—No, the larger sections would show less.

Q—Steel springs made of material 0.007" diameter for business machines work satisfactorily but beryllium copper failed. A—Size of material should have been increased on the beryllium copper due to the difference in modulus of elasticity.

## GOLDEN GATEMEN BECOME AIR-MINDED AT NOV. MEETING

Visit Airplane School, Shops

By S. Craig Alexander

The November meeting of the Golden Gate chapter was held at the Oakland Municipal Airport, with dinner at the Oakland Airport Inn, followed by a very interesting visit to the Boeing School of Aeronautics and the hangars of the United Air Lines.

The divisions visited included the wing and body shops, the engine shop, the sheet metal and welding shops, the radio laboratory, the propeller laboratory and the instruments laboratory. It was extremely interesting to observe the great advance that has taken place in body and wing design whereby the large passenger planes have developed from unwieldy looking tri-motored planes of only a couple of years ago to the present trim bi-motor, 3 miles-a-minute, stream-lined planes in passenger service between the Pacific Coast and the East.

In the engine shop we were shown a great variety of aeroplane engines in various stages of assembly. It was very interesting to observe the manner in which the present light weight and efficient motor has been developed.

We were shown in the wind tunnel the effect of design on balance, given demonstrations of heat treatment of duralumin and an interesting talk in the sheet metal and welding shops, shown artificial horizons, gyroscopes, artificial compasses, etc., in the instruments laboratory, and enjoyed a dissertation on the radio, navigational beacons and landing beams in the radio laboratory.

### LEHIGH HAS FORGING TALK

H. L. Day Speaks Before 125 Men at Good Meeting on Dec. 9

By Neil Metcalf

The December meeting of the Lehigh Valley chapter was held at Lehigh University, Bethlehem, on the 9th.

Approximately 125 members and guests heard H. L. Day, Ingersoll-Rand Co., Phillipsburg, N. J., speak on "Forging."

The history of forging was outlined from earliest times to the present and illustrated by means of lantern slides. Modern practice was dealt with in detail and covered the hydraulic press, steam hammer, drop forge hammers, rolling and extrusion.

The paper was very well received and a keen discussion followed.

### LINCOLN DESCRIBES ELECTRODE

Lincoln Electric Co. offers a leaflet on Ferroweld electrodes for welding cast iron. Welding procedure is carefully presented. A feature of Ferroweld is the remarkably low heat with which it can be used, thus minimizing the possibility of either the weld or work cracking.

### RAAB WITH BABCOCK & WILCOX

Fred C. Raab, formerly with Brown-Lipe-Chapin Co., Syracuse, is now with Babcock & Wilcox Tube Co., Beaver Falls, Pa.

## OPEN HEARTH TALK STARTS PHILADELPHIANS' QUESTIONS

Earl Smith is the Speaker

By Adolph O. Schaefer

Beneath the innocent-sounding title of "Open Hearth Steels," Earl Smith of the Republic Steel Corp. packed enough dynamite to precipitate a discussion amongst Philadelphia's members that was almost as hot as the title.

The occasion was the third meeting of the season for the Philadelphia chapter. Mr. Smith covered the economic aspects of the open hearth process and an outline of its practice.

The effects of modern research were apparent in a study of slags which included some excellent petrographic slides. The speaker wound up with a review of the types of open hearth steel.

Questions were not slow in coming. Dr. Styri, of SKF Industries, and Dr. Seil, of E. J. Lavino & Co., brought on a lively skirmish over the interpretation of petrographic studies.

Many members took advantage of Mr. Smith's wide experience to inquire as to what types of alloys he would use for various services. Much interest was manifested in spring steels, and the possibilities of the new type of front wheel suspension to be used on various automobiles.

The policy of the chapter is to adjourn meetings at 10:30 P. M. This was done in this case, but the discussion at this point was so lively that the meeting had to go on to a much later hour to satisfy those present.

Both dinner and the meeting were attended by record crowds, and we have reason to believe the depression is over.

## BUFFALO ENJOYS MOVIE AND TALK ON MAKING OF CHAINS

Frank Stahl Technical Speaker

By F. L. Weaver

The Nov. 9 meeting was probably the best attended in Buffalo chapter history. Sixty members and guests, after the usual good dinner, were anxious to see the private talking picture, "The Flight of the Arrow," through the courtesy of the Pierce-Arrow Motor Car Co. of Buffalo.

The film showed the preparation and run of the record breaking 24-hour speed test at Salt Lake City, Utah. Thirty-some records were broken, and an average of 118 miles per hour for 24 hours was established in weather varying from a 120° hot calm day to rain and wind of gale force. A total of 3000 miles were covered in 24 hours of running time in 25 hours and 36 minutes elapsed time.

Chairman Llewellyn then turned the meeting over to the technical chairman of the evening, N. F. Tisdale, who graciously introduced the speaker, Frank Stahl of Columbus McKinnon Chain Co. Mr. Stahl spoke at length on the history of chain and chain manufacturing, and told about the first patents in 1634 of mooring chain. The present day methods of manufacturing and the predominance of iron chain to heat-treated alloy steel chain were featured.

## STEEL MAKING IS HERTY'S SUBJECT

Clevelanders Hear Latest in Melting Practices

By H. B. Pulsifer

Dr. Charles H. Herty, Jr., talked to the Cleveland chapter on the evening of Jan. 8 and gave the members in the "Parts City" a rich discourse on the latest developments in steel making as related to the properties of finished steel.

He swung right into the chemistry of steel melting and showed how de-oxidation influenced such properties as impact toughness, age hardening effect, hardenability and grain size.

Needless to say, Dr. Herty had a grist of facts and figures. Those who expected a compendium on inclusions and tensile properties quickly shifted into high and took a spin with the research in modern metallurgy as carried out at the Carnegie Institute of Technology at Pittsburgh. No doubt that a good many were mildly astonished and resolved to read more carefully the Society publications about all of these newer topics.

This meeting was also sustaining members' night and the representatives of eight companies were seated, decorated with red carnations, at the speakers' table. After the dinner Chairman Van Horn presented the sustaining members and exchanged friendly greetings with Mr. Stotz of the Pittsburgh chapter, some pithy references being made about the chapter memberships.

By the time the coffee talk was finished at least two hundred had assembled for Dr. Herty's discourse. The brilliant Pittsburgh savant had his argument well supported with slides and charts. J. V. Emmons was technical chairman and bravely conducted the lively discussion.

## BOSTON HEARS OLDACRE TALK ON QUENCHING, CUTTING OILS

Dr. Williams Dinner Speaker

By Howard E. Handy

The December meeting of the Boston chapter was held at Massachusetts Institute of Technology on Dec. 8. The speaker was William H. Oldacre, director of engineering and research, D. A. Stuart & Co., his subject being "Quenching and Cutting Oils." Mr. Oldacre is a familiar figure at the annual National Metal Congress and is an outstanding authority on cutting lubricants and their application in the machine-shop. His talk was very interesting and a considerable amount of discussion followed his presentation.

Prior to the meeting, a family-style dinner was served in Walker Memorial, after which Dr. Robert S. Williams, of M. I. T., presented a coffee-talk on "New Light Alloys." Dr. Williams described some of the characteristics of the aluminum, magnesium and beryllium alloys used in industry and also discussed the treatment for hardening and coloring aluminum alloys.

### Alloys of Iron Research

FRANK T. SISCO, Editor

The third of this series of important monographs will be published early in March. It covers

## The Alloys of Iron and Tungsten

By J. L. GREGG

Metallurgist, Battelle Memorial Institute

Its list price is \$6.00, but members of American Society for Metals may save \$1.00 by using the coupon below. Note also that if either of the previously published monographs is ordered at the same time, \$1.00 is saved on each volume.

### COUPON

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Please send me monographs of Alloys of Iron Research as checked, for which I enclose check or purchase order.

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### Employment Service Bureau

Address answers care of A. S. M., 7016 Euclid Ave., Cleveland, unless otherwise stated.

#### POSITION OPEN

INDUSTRIAL FURNACE SALESMAN: We need man who has had experience selling industrial heat treating equipment. He should be familiar with iron, steel and automotive industries. State full particulars, experience and salary expected. Box 1-7.

#### POSITIONS WANTED

CHEMIST-METALLURGIST: Experience covers smelting, refining and seven years of research in magnetic materials, tool steels and heat treatment. Box 1-5.

METALLURGICAL ENGINEER: Taught metallurgy and metallurgy at a midwestern university for last four years. Desires position in industry. Would consider sales position. Box 1-10.

SALES ENGINEER: Ten years with present firm selling steel products on Pacific coast; well known to the trade and the jobbers; age 44. Seeks connection with reputable firm. Successful sales record on east and west coast. Box 1-15.

METALLURGICAL ENGINEER: Recent graduate with thorough foundation in metallurgical problems. Capable. Will furnish references. Box 1-20.

METALLURGIST: B. S. from Case, 1932. Age 25; experimental metallographer. Three years in development of age hardening alloys. Box 1-25.

CHEMIST-METALLURGIST: Knows chemical analysis, physical testing, metallurgy, heat treating, pyrometry. Experienced in ferrous and non-ferrous, high speed alloys, etc. Box 1-30.

ENGINEER: Thoroughly experienced in chemistry, metallurgy, heat treating and metallurgy. Knows selection of automotive steels. Box 1-35.

METALLURGICAL ENGINEER: Has had thorough training including practical heat treating experience. Received M. S. in Metallurgy recently, specializing in metallurgy. Competent research worker. Box 1-40.

EXECUTIVE METALLURGIST: Qualified to head a laboratory or melt in various types of furnaces. Also sales experience. 16 years with U. S. Steel Corp. and later was chief chemist for truck manufacturer. Ten years foundry experience. Very best references. Box 1-45.

GRADUATE METALLURGIST: Experience includes routine chemical analysis of both ferrous and non-ferrous, physical testing, metallography and experimental heat treating. Author of several published articles. Qualified to establish and operate laboratory. Box 1-50.

GRADUATE METALLURGIST: 14 years' experience on steel problems connected with chemical and metallurgical investigations, research, production and plant management. Well recommended. Box 11-5.



## SILICON IN STEEL IS NEW YORK TOPIC

Walter Crafts' Talk Brings  
out General Discussion

By F. H. Clark

The New York chapter held its December meeting on the 18th at the American Society of Swedish Engineers. Walter Crafts of the Union Carbide & Carbon Research Laboratory spoke on "Some Effects of Silicon in Steel."

The presence of 0.8% silicon will prevent surface decarburization which Mr. Crafts believes is due to a lowering of the melting point of the silicon bearing slag and a subsequent burning off of the surface of the steel.

Additions of silicon decrease the effect of mass in the lower alloy steels and, for small sections of normalized steels, silicon increases the amount of martensite. The high strength found in steels with more than 0.8% silicon and 0.7% manganese is accompanied by loss in ductility. Another disadvantage in silicon is that, on remelting, blow holes occur unless the silicon is removed from the charge.

During the discussion which followed, F. T. Sisco asked why silicon improved all the physical properties in a steel when the other alloys present were well balanced? Mr. Crafts believed this was due to deoxidation by the silicon.

N. A. Kahn from the Brooklyn Navy Yard asked how silicon steels reacted to arc welding and received the reply that high silicon steels could easily be welded.

Mr. Sisco further asked how to overcome the prejudice of the average open hearth man to silicon additions in a 100-ton furnace because of the higher temperatures involved and the subsequent deterioration of the furnace lining. Mr. Crafts answered that silicon could be added to the ladle.

## NOTRE DAME HEARS COLWELL AND GROSSMANN THIS SEASON

Die Castings, Stainless are Topics

One of the most interesting talks presented to the Notre Dame group was given by D. L. Colwell, of the Stewart Die Casting Company, at the meeting held November 16th, in the Cushing Hall of Engineering. The speaker discussed die casting, with special reference to aluminum and zinc-base alloys. He prefaced his address with an explanation of general die casting equipment and procedure, enumerating the various stages of development up to the present.

Dr. Marcus A. Grossmann, research engineer of the Illinois Steel Company, addressed the group on December 11th, in Cushing Hall of Engineering. The subject of his address was "Stainless Steel." In his introduction, Dr. Grossmann gave a brief resume of earlier misconceptions of the conditions that caused some ferrous alloys to be relatively immune to corrosive attack.

[Since reports of Dr. Grossmann's fine talks on this subject have appeared several times in this paper, it will not be reported here again at this time.—EDITOR.]

## GILL TALKS AT ST. LOUIS

Talk on Tool Steels Followed by  
Special Entertainment Program

By C. M. Stevenson

St. Louis chapter held a regular monthly meeting in Alton, Ill., on Dec. 15. The speaker of the evening was J. P. Gill, chief metallurgist of the Vanadium-Alloys Steel Co. His subject was "Recent Advances in Metallurgy of Special Steels and Cutting Material."

Mr. Gill's talk was very well received and after he had completed his address the program committee presented an entertainment. We believe that this meeting was one of the most successful and largest that this chapter has had for quite some time.

## SOUTHERN TIEMEN MOVE TO CORNELL FOR NOV. MEETING

See and Study New Furnace

By E. J. Mackenzie

The November meeting of the Southern Tier chapter was held Nov. 13 at Cornell University, Ithaca, N. Y. The meeting was arranged through the courtesy of one of our members, Prof. H. Diederichs, head of the department of experimental engineering of Cornell.

The subject of the discussion was "Some Recent Developments in an Oil-Fired Crucible Furnace for Non-Ferrous Melting." A demonstration of the furnace was given at the college foundry in the afternoon. E. H. Carruthers, who is the man who did the research work on the furnace, gave the demonstration and explained the working points of the furnace, but left the details and discussion for the meeting.

After dinner came the meeting and lecture. Mr. Carruthers explained the furnace in detail, using slides to give a clear picture of the points which he made. The demonstration, dinner and meeting were all very much appreciated by the men who were present.

There were over 70 men at the meeting and Prof. Diederichs very kindly made the wish that the Cornell meeting be made an annual affair.

## COYLE REVIEWS CAST IRON PROGRESS FOR PITTSBURGH

Talk Creates Discussion

By George P. Halliwell

The second regular meeting of the Pittsburgh chapter was held at the Keystone Athletic Club. After a very enjoyable dinner, W. H. Phillips extended the chapter a word of greeting in his capacity as president-elect of the National Society.

F. B. Coyle of the International Nickel Co. then gave an interesting talk on "Recent Developments in Cast Iron." Mr. Coyle showed a number of slides showing the comparative properties of the nickel, nickel-chromium and plain carbon cast irons. Alloy cast irons with tensile strengths up to 100,000 lb. per sq. in. have been obtained with 8-10% elongation and a Brinell of 225. Such alloys have great depth of hardness and resistance to acid corrosion. A special alloy containing 4.5% nickel and 1.5% chromium produced a Brinell hardness of 650 and outwore a 13% manganese steel.

Considerable discussion centered around the relative properties of some of our trade marked alloy cast irons.

## RHODE ISLAND HAS TALK ON CUTTING AND QUENCHING OILS

Hear W. H. Oldacre Dec. 6

By Walter M. Saunders, Jr.

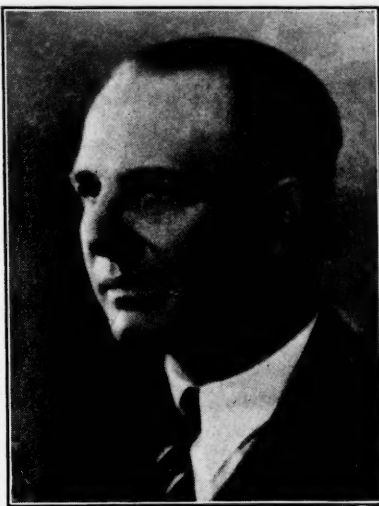
At the Dec. 6 meeting of the Rhode Island chapter, W. H. Oldacre, director of research, D. A. Stuart & Co., described in his entertaining manner the types of oils used as lubricants in machining operations.

A few pertinent remarks about quenching oils showed that the important properties of a good oil for this purpose were its mobility, ability to increase heat transfer, and resistance to sludging, or oxidation.

The function of cutting and drawing oils was summarized by Mr. Oldacre, as the prevention of pick-up between tool or die and the work. It was Mr. Oldacre's belief that difficulty in cutting was due chiefly to welding of the chip to the tool, and he brought out that the sulphurized oils did much to prevent this. The sulpho-chlorinated oils have been developed to neutralize the wear effect on the tool, at the same time preserving the excellent finish.

In the discussion which followed, Mr. Oldacre stated that the activity of sulphur in sulphurized petroleum oils was greater than in fatty oils, thus increasing the anti-weld properties, but at the same time decreasing the resistance to wear.

## Brick in New Job



E. G. Brick, for many years connected with the metallurgical department of the Cadillac Motor Car Co., has become associated with the alloy division of the Youngstown Sheet & Tube Co., 4-138 General Motors Building, Detroit, Mich.

Mr. Brick is a very active and valuable member of the Detroit chapter of the Society, having served as a member of the executive committee for a number of years, and now is serving efficiently as its secretary.

## CINCINNATI CURIOUS ABOUT HIGH STRENGTH CAST IRON

Quiz Speaker After Talk

By N. C. Strohmenger

At Cincinnati's meeting on Nov. 15, Oliver Smalley, technical director, Gray Iron Institute of America, Pittsburgh, spoke on the subject of "High Strength Cast Iron." An interesting discussion which covered the following questions and answers:

Q—To what extent is the Meehanite process used for rolls for cold rolling of steel? A—Not tried to any great extent. Somewhat in the experimental stage on rolls of 90 scleroscope.

Q—Why do they use a high temperature in heat treating Meehanite? A—Critical point is affected by the percentage of steel and silicon present in the iron.

Q—Is water quenching required on some Meehanite? A—Yes, on types "A" and "B."

Q—Would a draw at 400 to 500 deg. Fahr. be considered as the brittle range on Meehanite? A—No.

Q—Are all drawing dies made of Meehanite heat treated? A—Not necessary in some cases.

## EXPLAINS HOW TO CONTROL ATMOSPHERE FOR HARDENING

Rockford Holds Meeting Nov. 17

By Freeman G. Anderson

Mr. Coyle of the Leeds & Northrup Co. explained controlled atmosphere equipment for hardening tool steels to Rockford chapter, November 17th.

The speaker outlined a method for obtaining a controlled furnace atmosphere by dropping oil into a separate cracking furnace where this oil was gasified and introduced into the bottom of a hardening furnace and ignited at the exhaust outlet in the lid, the gasifying or cracking furnace being maintained at controlled temperature so as to produce gas of definite characteristics.

The atmosphere produced entirely eliminates scaling, pitting and decarburization on water or oil hardening tool steels.

Tools hardened in this manner were compared with others hardened in conventional gas furnaces as well as electric furnaces by comparing Rockwell hardness from surface to center. Hardness of higher order on the pieces treated in controlled atmosphere was explained by the fact that there being no scale to act as an insulating layer, the quenching medium would cool the piece more rapidly.

In the discussion following this presentation considerable interest was evidenced by the questions and discussion.

## L. F. LOTTIER IN NEW CONNECTION

Lawrence F. Lottier, formerly metallographer with Rotary Electric Steel Co., Detroit, has become an assistant to Robert G. Guthrie in the metallurgical department of Peoples Gas Light & Coke Co., Chicago.

H. O. Swoboda, Inc., manufacturers of Falcon furnaces and heaters, have taken larger quarters at 4301-3 Main St., Pittsburgh.

## MONTREAL MEMBERS HEAR H.J. FRENCH TELL NICKEL'S STORY

100 Attend November Meeting

By Gordon Sproule

The second monthly meeting of Montreal chapter was held on Nov. 6.

Forty members and guests attended the dinner and about 100 came for the lecture. The coffee talk consisted of an excellent sound film giving the "Story of Nickel."

The lecture was given by H. J. French of International Nickel Co. It is hardly necessary to remind readers that Mr. French is one of America's leading metallurgists. In 1933 he delivered the Campbell Memorial Lecture at the Annual Meeting of the A.S.S.T., and a few years ago he was recipient of the Howe Medal.

Mr. French spoke on "Alloy Constructional Steels," including varieties used in the construction of machines, motor-cars, etc., but not tool steels.

[Mr. French's interesting talk on this subject has been reported several times in the REVIEW, so it will not be abstracted at this time.—Editor.]

## PHILADELPHIA MEN FROLIC AT BIG SEVENTH ANNUAL SMOKER

They Eat, Drink and Get Merry

By Adolph O. Schaefer

Following an old Spanish custom, the Philadelphia chapter dispensed with technical sessions during December and held its Seventh Annual Smoker.

The board was spread at the famous Bookbinders' Restaurant on Dec. 8. Quantities of food were first in order! Quantities of the new high power brew were on tap! Quantities of smokes of every description were on hand! And then came the show!!

All of the luscious adjectives ever heaped upon the beaming chorus of a Ziegfeld production would be inadequate to describe the feast of human pulchritude that was spread before the eyes of the audience. For hours the song and dance went on, to the tinkle of the piano in front, and the fizzing of the beer behind.

Due to the excellent management of the chairman of the committee, George W. Keller, the night will long be remembered.

## STUDY MINING IN ONTARIO

Ontario Minister of Mines Gives Chapter  
Some Interesting Facts

By John W. McBean

The opening meeting of the Ontario chapter was held in Toronto on Oct. 13.

About 140 men enjoyed an address by the Hon. Charles McCrear, Minister of Mines for Ontario, on the position of Ontario in the metallurgical field—principally the non-ferrous field. He said that total dividends from metal mines in 1932 in Ontario were nearly \$18,000,000, and that nickel and copper ranked first, with gold second and silver and cobalt following.

Mr. McCrear then told about the recent progress in mining and refining the metals produced in Ontario.

## ONTARIO STUDIES GAS ATMOSPHERES

J. A. Dow Gives Valuable Tips  
On Theory and Practice

By John W. McBean

At the December meeting of the Ontario chapter, after the dinner at the Royal York Hotel, we had the pleasure of welcoming back our former member, J. A. Dow, of Holcroft and Co., Detroit, who gave a survey of recently developed furnace atmospheres in connection with bright annealing, hardening, and gas carburizing.

He pointed out that products of combustion were oxidizing, that unburned producer gas showed little tendency either to scale or to carburize, but that city gas, natural gas, propane and butane gave increasing tendencies to reduce and to carburize. Various mixtures of gas give intermediate results, but any reactions between the different gases should be at least partly completed before the steel comes in contact with the mixture. Conditioning is, therefore, often done in a separate furnace.

The effect at a given temperature of a particular gas mixture on the carbon content of the surface of a steel subject to it can be predicted. If a gas mixture contains 0.7% carbon at 1600° F., it would tend to carburize a low carbon steel and decarburize a high carbon steel, but would be neutral to a steel of that composition. In hardening the atmosphere should be neutral to the average carbon content of the steel at the temperatures used. This gives increased and more uniform surface hardness and a greater hardening depth, because scale acts as a heat insulator, and when it is not present, quenching takes the heat out of the steel more rapidly.

When carburizing, as the carbon from the gas is used up, different parts of the retort have different gas compositions. Therefore the problem of the positive circulation of the gas becomes important. Conditioning of the gas for carburizing is also difficult. The effects of moisture and the products of combustion are very troublesome, often producing decarburization faster than the high-carbon gases can carburize, and moisture should be kept to less than one-half of 1%.

For this work natural gas has been of considerable help, as it is fairly free from combustion products and the very high carbon products.

## RYERSON BUYS BACON & CO.

Joseph T. Ryerson & Son, Inc., has purchased the stock and good will of Bacon and Co., iron and steel company of Boston. Bacon and Company was organized in 1868 by Josiah E. Bacon. The present plant is located at 107-119 Oliver Street.

This is a merging of old-time interests, for the Ryerson Co. was established in 1842.

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## GIVES MEATY TALK ON WELD PRACTICE

Holmberg Gives Practical Advice to Montreal Men

By Gordon Sproule

Montreal chapter is at a loss for superlatives to describe the enthusiasm of the December meeting; so simple statements must suffice: The dinner was crowded and the lecture was 100%. Mike Carmichael, of Shawinigan Stainless, has completely beaten Hard Times in preparing our season's program.

On this occasion we were instructed and entertained by J. C. Holmberg, of Struthers-Wells Co., with "Modern Shop Welding." This talk contained many practical ideas.

He made several recommendations. For mild steel plates more than 1 in. thick the edges are machined to form a groove of  $\frac{1}{8}$  in. radius at the bottom, with walls flaring at 7° and lips  $\frac{1}{8}$  in. thick butting at the bottom.

Beads are laid on  $\frac{1}{8}$  to  $\frac{1}{4}$  in. thick. Each bead is cleaned with a revolving brush, and well peened. Currents vary with the job, up to 600 amps. with heavy flux-coated "hot" rod; both alternating and direct current is used; welding rods are  $\frac{1}{8}$  in. diameter or less. Test plates are welded as a continuation of the seam and are heat treated with the vessel.

Modern coated rod electric welding produces astoundingly good and reliable results. Test pieces from the test plate mentioned above, machined with a reduced section, must show a strength equal to the original plate; they often show 59,000 to 66,000 lb. per sq. in. tensile and up to 37% elongation in 2 in. Bend test pieces will often bend flat on themselves. All weld test pieces must give 55,000 lb. tensile and 20% elongation. Two specific gravity test pieces of 10 c.c. volume must show a minimum of 7.80.

The reading of his paper by Mr. Holmberg was followed by discussion lasting fully twice as long, facilitated by our new question forms.

An innovation consisted of exhibits prepared by two of our sustaining members, Edgar Allen & Co., and G. D. Peters Co., showing tool steels and welding supplies respectively. These exhibits were in place of a coffee talk and attracted much attention.

## CAST IRONS ARE SUBJECT OF WORCESTER MEETING NOV. 16

R. F. Harrington is Speaker

By R. R. Tatnall

Worcester chapter, on Nov. 16, heard R. F. Harrington, Hunt-Spiller Mfg. Corp., Boston, give a most interesting talk on "Cast Iron as an Engineering Material."

Cast iron may be relied upon for engineering uses if certain points are observed in its manufacture. First of all, design must be good, particularly with regard to fillets and variation of section. Sound metallurgy is required to produce reliable castings, and this topic covers the raw material, melting practice, and pouring procedure. The commonly used test bars are not indicative of quality in castings. Non-destructive tests, such as X-ray, Brinell, etc., are usually made on the castings themselves.

Higher strength irons have been developed by variations in process and by alloying. Future possibilities are open in the field of heat treatment of castings to improve physical properties.

## INTERGRANULAR CORROSION IS WASHINGTON MEETING TOPIC

Talk Given by R. H. Aborn

By William H. Swanger

The first meeting of the Washington chapter for the 1933-1934 season on Oct. 20th was one of the largest ever held by the chapter. Dr. R. H. Aborn, metallurgist, U. S. Steel Corp. Research Laboratory, Kearny, N. J., addressed the meeting on the subject, "Austenitic Steels with Particular Emphasis on the Phenomenon of Intergranular Corrosion."

Dr. Aborn presented experimental data illustrating the conditions under which intergranular corrosion in austenitic steels takes place and discussed three methods by which it can be prevented.

An elaborate display of various semi-finished and fabricated articles which illustrated the uses to which stainless steels can be put and the various methods employed in their fabrication was arranged in the meeting hall by the United States Steel Corp. The display was most instructive and aroused a great deal of interest.

## NEW JERSEY HEARS TALK ON FORGING

Chapter Backs Two Courses in Metallurgy this Year

By Ernest O. Olds

The New Jersey chapter held its 44th regular meeting on Nov. 13 with about 200 members and guests present.

We were especially pleased to have our good friends, W. H. Eisenman, the national secretary, Ben Shepherd, of the Lehigh chapter, and our own Harry McKinney, a national director of the Society, with us.

Chairman Fraser announced that the chapter was actively co-operating with the Essex County Vocational High School in giving a general course on the "Fundamentals of Heat Treating." This was to be followed, later in the season, with a somewhat more advanced and detailed course in metallurgy to be given to our chapter members.

The principal speaker of the evening was H. L. Day, Ingersoll-Rand Co., Phillipsburg, N. J., who spoke on "Forgings," emphasizing small forgings.

He stressed the necessity for careful control of proper heat treating temperature, uniformity of heat distribution, soaking, and finishing off at as low a temperature as practical.

The advantages of air over steam for driving forging hammers were stated by R. J. Allen, Worthington Pump and Machinery Co., during the discussion which followed. Many other men participated in the discussion and it was brought out that by careful control of grain size machinability was improved 20%.

## YORK DEVOTES EVENING TO STAINLESS IRON AND STEEL

Speaker is W. B. Arness

By F. J. Allen and G. J. O'Neill

With the increased interest and enlarged attendance as observed at the November meeting of the York chapter, influenced, we believe, by the greater activity of local industries, the chapter feels quite heartened.

W. B. Arness, chief metallurgist of the Rustless Iron Co. of America, Baltimore, gave a most complete description of the analysis of the range of stainless iron and steel and the uses for which they are recommended.

Many samples of these materials served the lecturer in his description of their fabrication and proper application.

Discussion following the meeting was of the type that always brings out the gainful information sought by members and guests attending.

The class in metallurgy, sponsored by the chapter, is progressing nicely. The students show a remarkable degree of interest.

## WELDING TALK PRESENTED AT BUFFALO DECEMBER MEETING

Speaker is Everett Chapman

By F. L. Weaver

Members and guests of Buffalo chapter attended a very fine meeting on Dec. 14.

After dinner Chairman Llewellyn selected Marvin Gorcham as technical chairman for the meeting. Mr. Gorcham then introduced Everett Chapman, vice president of Lukenweld, Inc., Coatesville, Pa.

Mr. Chapman very clearly illustrated the qualitative method of finding the stresses in welded fabrication by means of polarized light with celluloid and synthetic resins.

Of particular interest were the illustrations of stresses due to faulty engineering design, contracting weld metal, improper current, lack of sufficient fillet, the discontinuity of contour of unavoidable stress and the concentration of stresses, especially at the rim, of graphite flakes in cast iron. He described the welding of Diesel engine frames and the importance of heat treatment following the welding of parts.

## DESCRIBES BLUEHEAD FURNACES

Cooley Electric Furnace Co., 47-32 Van Dam St., Long Island City, N. Y., has prepared a bulletin describing its new type MP Bluehead electric muffle furnace equipped with Doreco heating elements.

Theodore M. Gloeckner, who has been in the sales organization of Union Drawn Steel Co., Massillon, Ohio, for more than fifteen years, has been appointed district sales manager for the Philadelphia territory.

## WASHINGTON HEARS KINZEL

Talk at December Meeting Features Low Alloy Structural Steels

By William H. Swanger

The Washington chapter was fortunate in having Dr. A. B. Kinzel of the Union Carbide and Carbon Research Laboratories, Inc., as speaker for its December meeting.

Dr. Kinzel's talk, entitled "Structural and Engineering Alloy Steels," discussed low alloy steels whose content of expensive alloy constituents is not so high that their cost is prohibitive of their use for large-scale consumption for structural purposes.

An interesting point made by Dr. Kinzel was that sufficient information is available so that an alloy steel may be designed to meet specific requirements not only as to strength but also as to uses or applications, forming practices and economics.

## Corrections for National Metals Handbook

You should note carefully the following corrections for Metals Handbook and make proper notations in your book on the pages indicated:

**PAGE 267**—The last trade name in the second column—PRK-33 Cobaltcrom—should be deleted, as well as on page 276 where it again appears in the middle of the third column. In place of this trade name add Krokoloy (Cr, Co)—S

**PAGE 585**—The third line in the caption under the first chart should read as follows: Quenched, 1450 Degrees Fahr. into water.

**PAGE 856**—The figures in Table I should be as follows:

Diameter	Single Leg	60°	45°	30°
$\frac{1}{4}$	1,060	705	1,060	1,270
$\frac{3}{8}$	1,655	1,100	1,655	1,985
$\frac{1}{2}$	2,385	1,590	2,385	2,860
$\frac{3}{4}$	3,250	2,165	3,250	3,900
$\frac{1}{2}$	4,240	2,825	4,240	5,090
$\frac{3}{4}$	5,370	3,575	5,370	6,445
$\frac{1}{2}$	6,630	4,415	6,630	7,955
$\frac{3}{4}$	9,540	6,355	9,540	11,450
$\frac{1}{2}$	12,960	8,630	12,960	15,550
1	16,950	11,290	16,950	20,340
1 $\frac{1}{2}$	20,040	13,350	20,040	24,050
1 $\frac{1}{2}$	24,750	16,480	24,750	29,700
1 $\frac{1}{2}$	29,910	19,920	29,910	35,890
1 $\frac{1}{2}$	35,600	23,710	35,600	42,720
1 $\frac{1}{2}$	41,800	27,840	41,800	50,160
1 $\frac{1}{2}$	48,450	32,270	48,450	58,140
1 $\frac{1}{2}$	55,300	36,830	55,300	66,360
2	63,300	42,160	63,300	75,960

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If any member wants to keep his copies of the issues of Vol. XXI, 1933, in loose form and yet have a bound volume for his library, a complete bound volume will be supplied for \$5, postpaid.

## Addresses of Chapter Secretaries

- |   |   |
|---|---|
| <b>Baltimore</b><br>S. Proctor Rodgers, Industrial Fuel Dept., Consolidated Gas, Electric Light & Power Co., Baltimore, Md. | <b>New Jersey</b><br>John H. Johnson, Richelieu Terrace, Scotch Plains, N. J.             |
| <b>Boston</b><br>Howard E. Handy, Saco-Lowell Shops, Biddeford, Me.   | <b>New York</b><br>T. N. Holden, 1219 Glenwood Rd., Brooklyn, N. Y.                       |
| <b>Buffalo</b><br>F. L. Weaver, American Radiator Co., Bond Plant, Buffalo, N. Y.   | <b>Northwest</b><br>Alexis Caswell, 100 Builders Exchange Bldg., Minneapolis, Minn.       |
| <b>Canton-Massillon</b><br>H. J. Deal, 147 Roslyn Ave., N. W., Canton, O.   | <b>Notre Dame</b><br>W. F. Lewis, Notre Dame University, Notre Dame, Ind.                 |
| <b>Chicago</b><br>John A. Comstock, 5633 No. Kenmore Ave., Chicago.   | <b>Ontario</b><br>L. F. Fitzpatrick, Flexible Shaft Co., Ltd., Toronto, Ont., Canada.     |
| <b>Cincinnati</b><br>N. C. Strohmenger, Tool Steel Gear & Pinion Co., Cincinnati.   | <b>Philadelphia</b><br>Adolph O. Schaefer, 310 West Durham St., Mt. Airy, Philadelphia.   |
| <b>Cleveland</b><br>H. B. Pulsifer, Ferry Cap & Set Screw Co., Scranton Rd., Cleveland.                                     | <b>Pittsburgh</b><br>H. L. Walker, Box 521 N. S., Station, Pittsburgh.                    |
| <b>Columbus</b><br>L. H. Marshall, 3629 Weston Place, Columbus, O.  | <b>Rhode Island</b><br>Carl G. Peterson, Providence Gas Co., Providence, R. I.            |
| <b>Dayton</b><br>Fred M. Reiter, Dayton Power & Light Co., Dayton, O.   | <b>Rochester</b><br>Irving C. Matthews, Eastman Kodak Co., Rochester, N. Y.               |
| <b>Detroit</b><br>E. G. Brick, Youngstown Sheet & Tube Co., Alloy Division, 4-138 General Motors Bldg., Detroit.            | <b>Rockford</b><br>O. T. Muehlemyer, 700 Race St., Rockford, Ill.                         |
| <b>Golden Gate</b><br>R. S. Hirst, 2223 Channing Way, Berkeley, Calif.  | <b>Schenectady</b><br>L. L. Wyman, metallurgist, General Electric Co., Schenectady, N. Y. |
| <b>Hartford</b><br>John P. Howley, Pratt & Whitney Co., Hartford, Conn.   | <b>Southern Tier</b><br>W. S. Bennett, Elmira Water Light & R. R. Co., Elmira, N. Y.      |
| <b>Indianapolis</b><br>R. L. Fitzsimmons, 1342 No. Grant Ave., Indianapolis, Ind.   | <b>Springfield</b><br>Thomas P. Jones, Chapman Valve Mfg. Co., Springfield, Mass.         |
| <b>Lehigh Valley</b><br>H. L. Gifford, superintendent of Heat Treatment, Bethlehem Steel Co., Bethlehem, Pa.                | <b>St. Louis</b><br>C. M. Stevenson, Colonial Steel Co., 714 Cass Ave., St. Louis, Mo.    |
| <b>Los Angeles</b><br>Charles F. Lewis, 421 No. Duane St., San Gabriel, Calif.  | <b>Syracuse</b><br>C. H. Parmelee, Onondaga Pottery, Syracuse, N. Y.                      |
| <b>Milwaukee</b><br>J. Benton Druse, 626 E. Wisconsin Ave., Milwaukee, Wis.   | <b>Tri-City</b><br>Wayne L. Cockrell, Burgess-Parr Co., Moline, Ill.                      |
| <b>Montreal</b><br>Miss B. W. Brownrigg, recording secretary, 11th floor, McGill Bldg., Montreal, P. Q., Canada.            | <b>Washington</b><br>S. J. Rosenberg, Bureau of Standards, Washington, D. C.              |
| <b>Muncie</b><br>W. F. McCormack, Chrysler Corp., New Castle, Ind.  | <b>Worcester</b><br>R. R. Tatnall, 38 Parkton Ave., Worcester, Mass.                      |
| <b>New Haven</b><br>P. L. Clark, Bridgeport Brass Co., Bridgeport, Conn.  | <b>York</b><br>Charles M. Strickler, General Machine Works, York, Pa.                     |